

Objective Crime Data and Walking for Physical Activity

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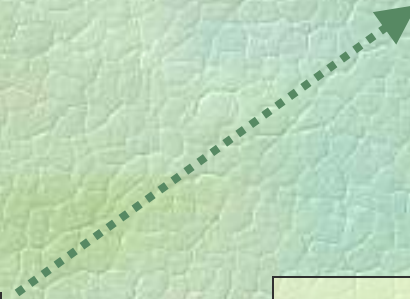
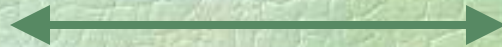
Physical Activity variables

SES
Income
Race
Education

HEALTH
Physical activity
Perception of own health

CRIME
Property
Violent

BUILT ENVIRONMENT
Parks
Sidewalks
Grocery-restaurant-retail cluster
Density



Hypotheses

- 💣 Higher violent and property crime rates are associated with less walking.
- 💣 Relationships between crime rates and walking are stronger for women and will differ between rural and urban areas (density).

Study Area: Washington State

5 Counties in Washington State



Study Area: 5 Counties



Scale of Measurement

Crime rates 1998-----Sheriff, police precincts
Seattle crime rates 1998-----Census tracts
Built environment data-----Census tracts, buffer
On-going study, 1995-2001-----Study subjects

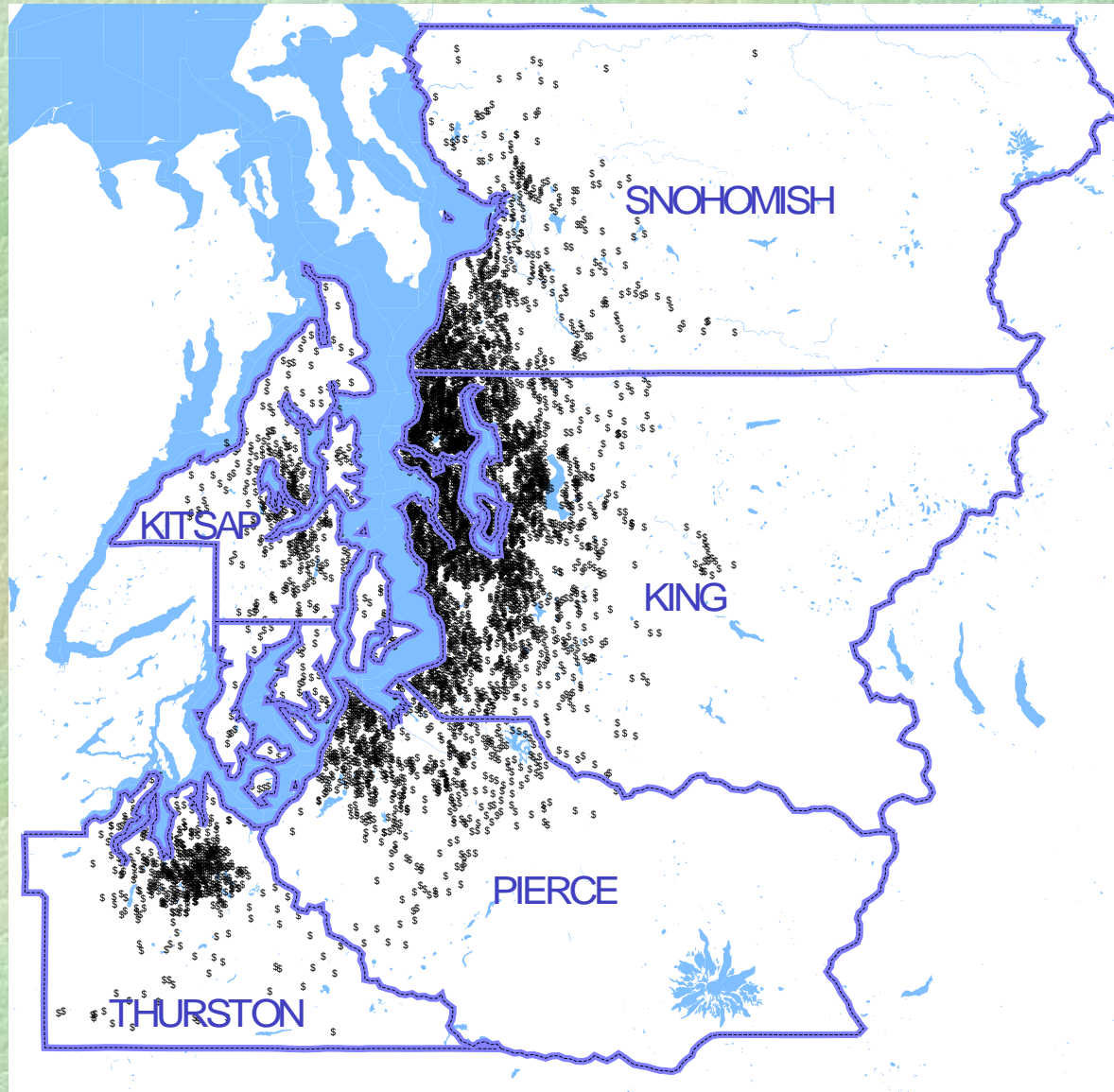
Mean 64 years

61% female

86% white

46% retired

Study Subjects Distribution



Analysis Methods

Relative Risk Regression Model

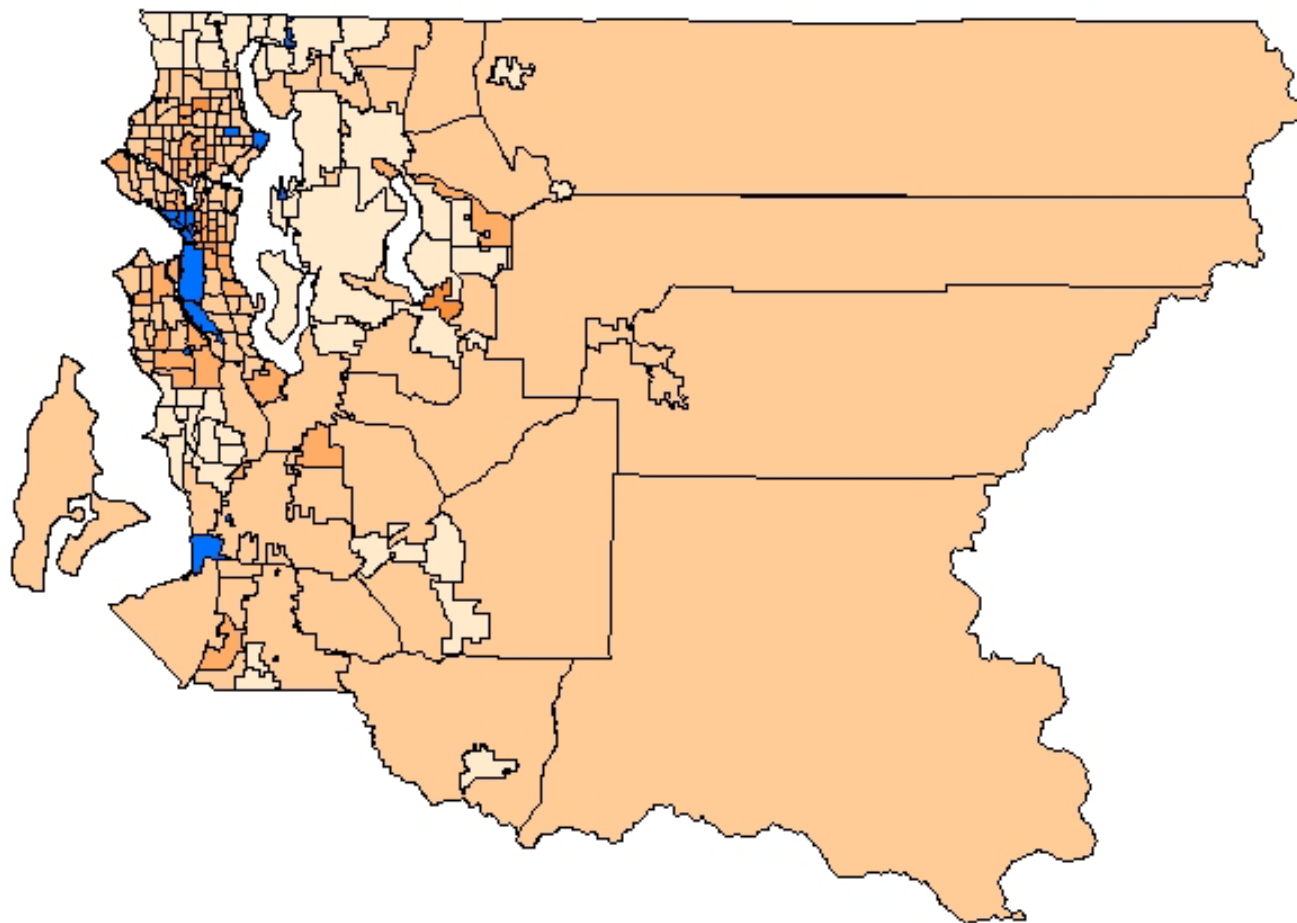
Crime variables used to predict if subjects walk

Adjustment for Potential Confounders

- age
- race, income, education
- percent park coverage, density

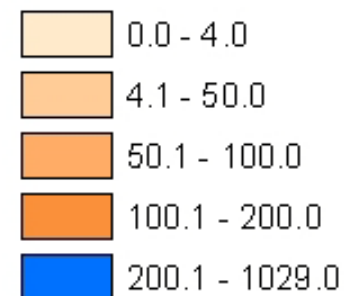
Stratification by Sex

Violent Crime King County

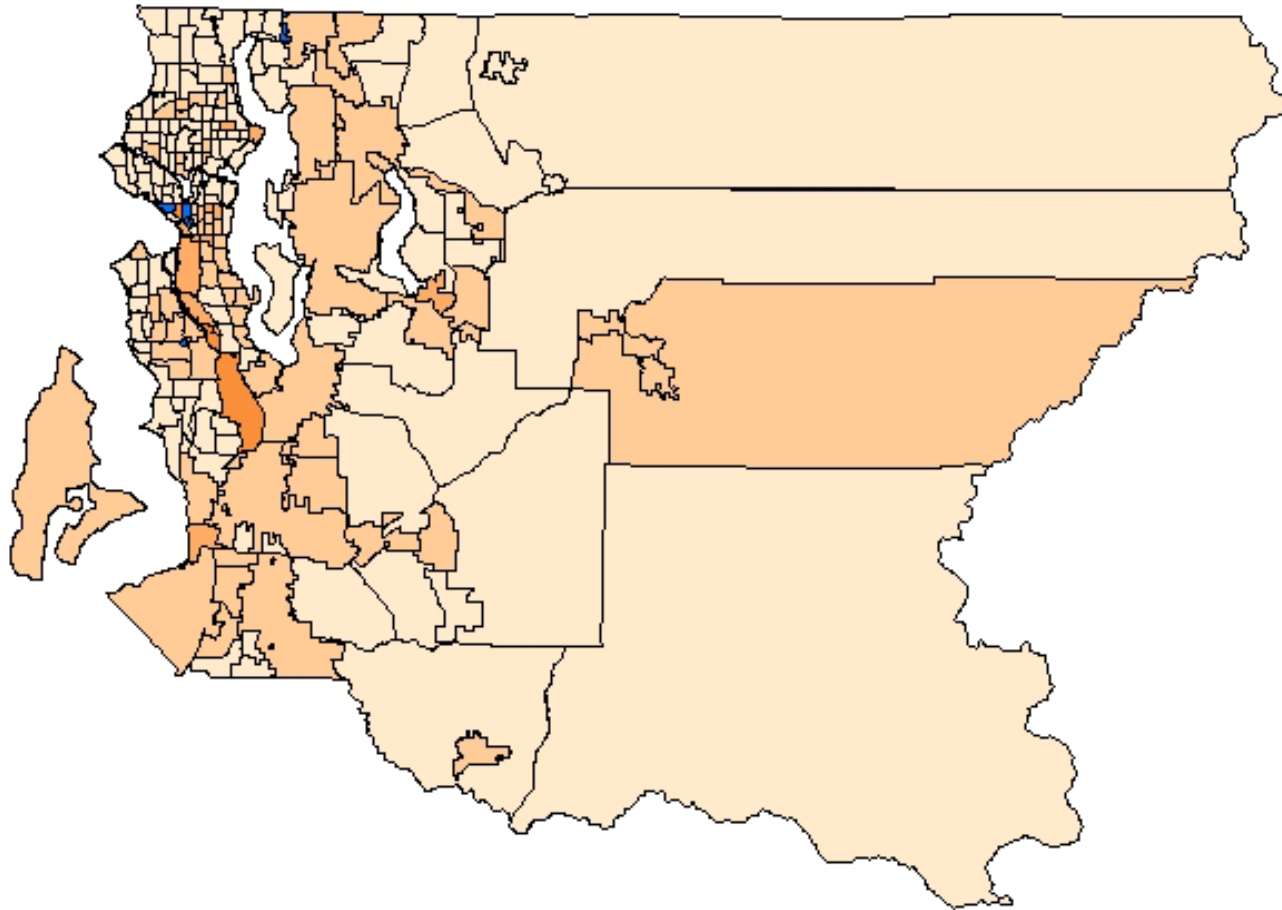


Washington State violent crime average
in 1998 = 16 per 1,000 persons.

Legend

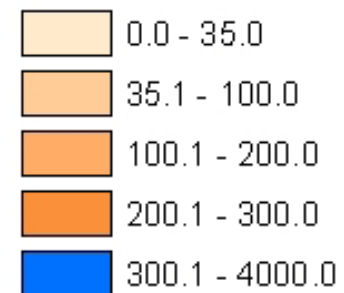


Property Crime King County

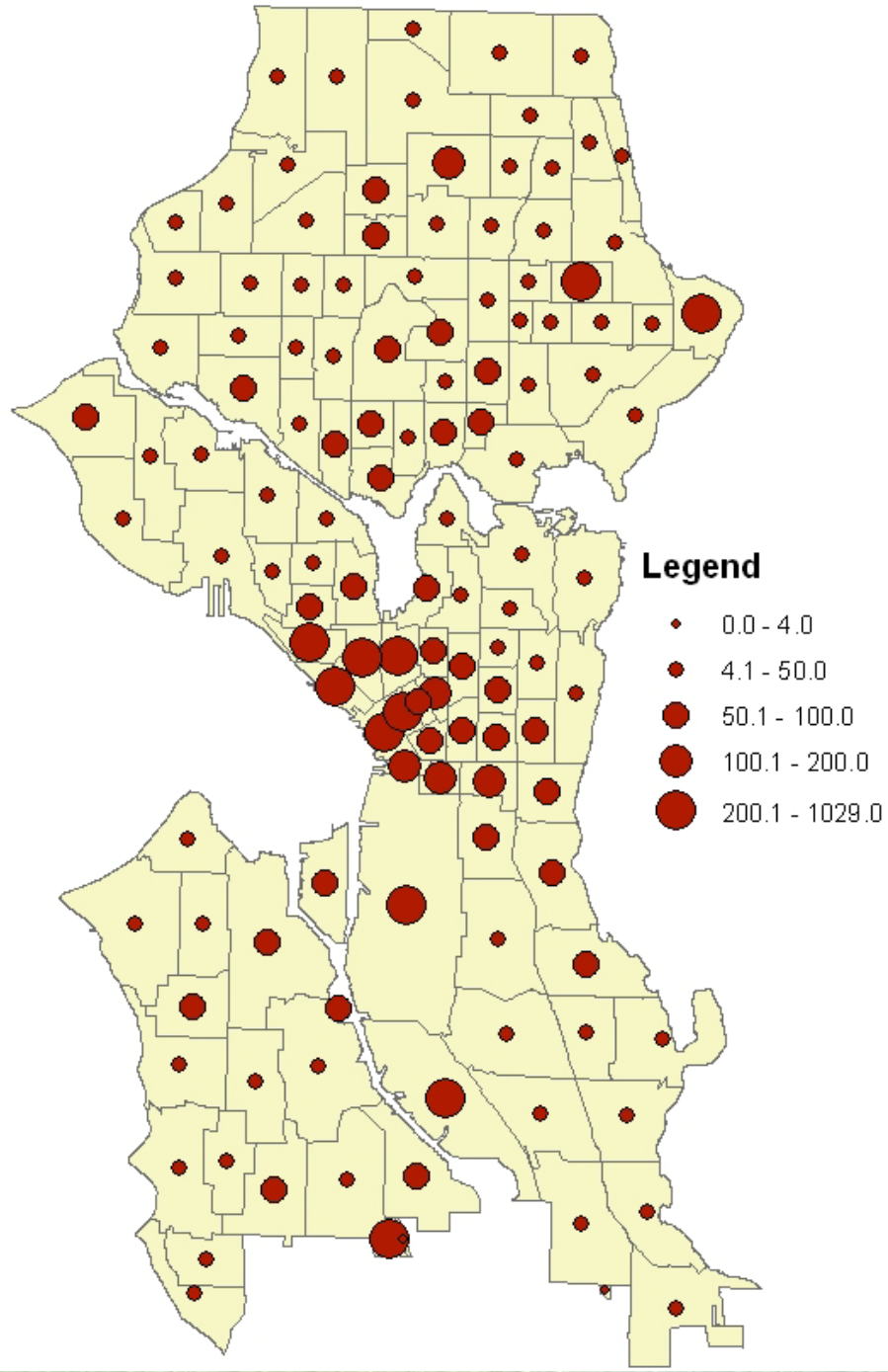


Washington State property crime average
in 1998 = 53/1,000 persons

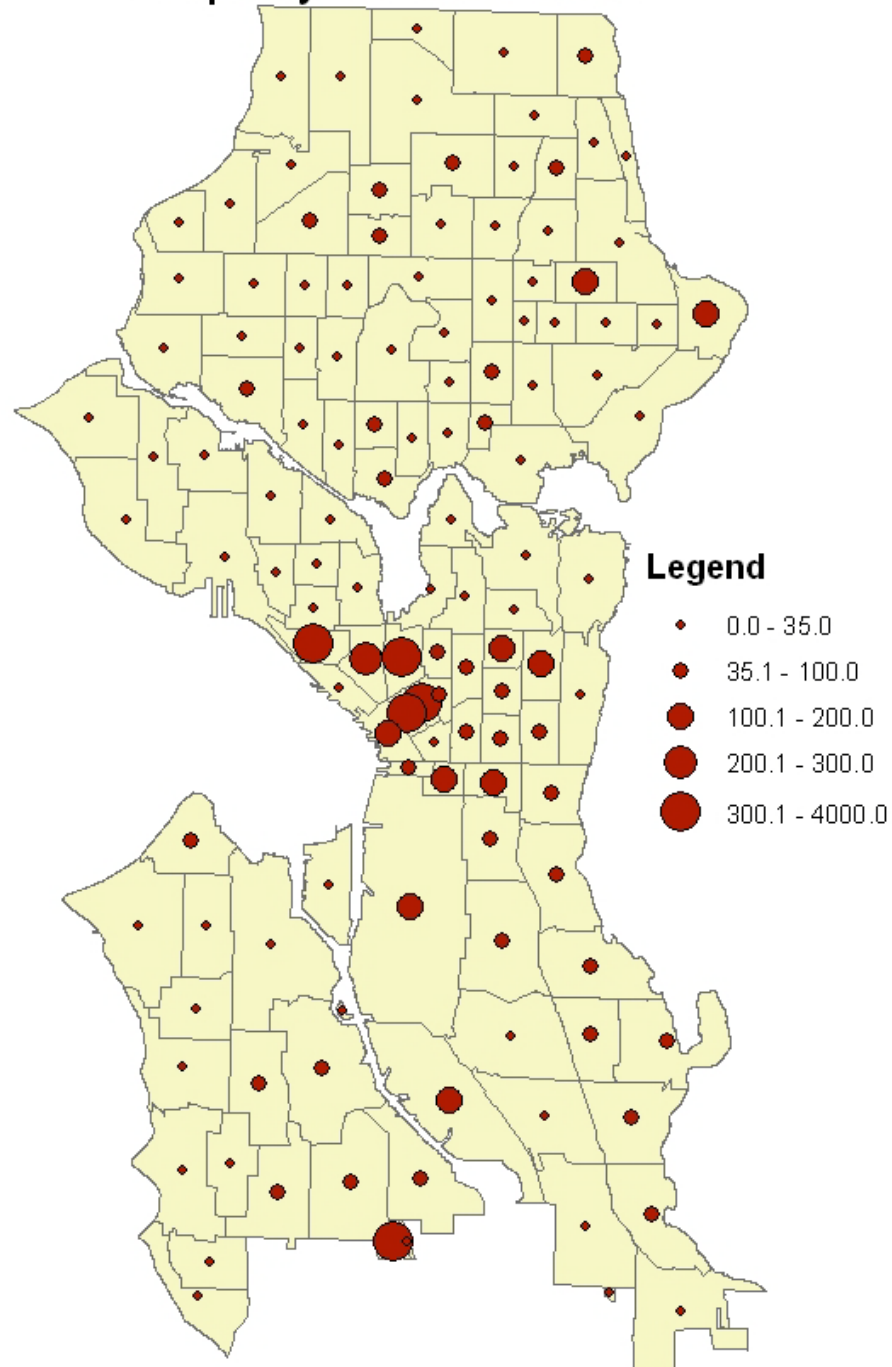
Legend



Violent Crime Seattle



Property Crime Seattle



Study Subjects by Crime Type/Level

Variables	Violent crime LOW	Violent crime HIGH
	N = 988	N = 879
Sex, male, %	42	35
Age, mean	63	65
Race, white, %	90	83
Income		
<\$25,000/yr, %	21	28

Study Subjects by Crime Type/Level

Variables	Violent crime LOW	Violent crime HIGH	Property crime LOW	Property crime HIGH
	N = 988	N = 879	N = 965	N = 902
Sex, male, %	42	35	40	37
Age, mean	63	65	63	64
Race, white, %	90	83	89	84
Income				
<\$25,000/yr, %	21	28	21	27

Crime and Walked Any



Built Environment Variables by Crime Areas

	Violent Crime LOW N = 988	Violent Crime HIGH N = 879	Property Crime LOW N = 965	Property Crime HIGH N = 902
Sidewalks				
mean length, km*	8	19	12	14
Commercial Centers: grocery, restaurant, retail, mean	0.3	0.8	0.5	0.6
Parks, % coverage	3	5	4	4

* King County only

Adjusted Results: All Study Subjects

Exposure	Outcome	Adjusted RR	CI
Rate violent crime	Any walking	.99	.97-1.01
Rate property crime	Any walking	1.00	.97-1.03

Adjusted Results

Men / Women

<i>WOMEN ONLY</i>		Adjusted			
Exposure	Outcome	RR	CI	p-value	
Rate violent crime	Any walking	1.01	.99-1.03	<i>insignificant</i>	
Rate property crime	Any walking	1.03	.99-1.07	<i>insignificant</i>	

<i>MEN ONLY</i>		Adjusted			
Exposure	Outcome	RR	CI	p-value	
Rate violent crime	Any walking	.97	.94-1.00	.05	
Rate property crime	Any walking	.97	.94-1.02	<i>insignificant</i>	

Other Approaches

- Linear regression: predict hours walked per week
- Seattle only
- King County only
- Urban/rural stratification

Limitations to Study

- Crime data at various levels
- Issues affecting crime reporting
- Self-reported physical activity
- Recall issues
- Generalizability

Conclusions

💣 Higher violent and property crime rates are associated with less walking.

FALSE

💣 Relationships between crime rates and walking are stronger for women and will differ between rural and urban areas (density).

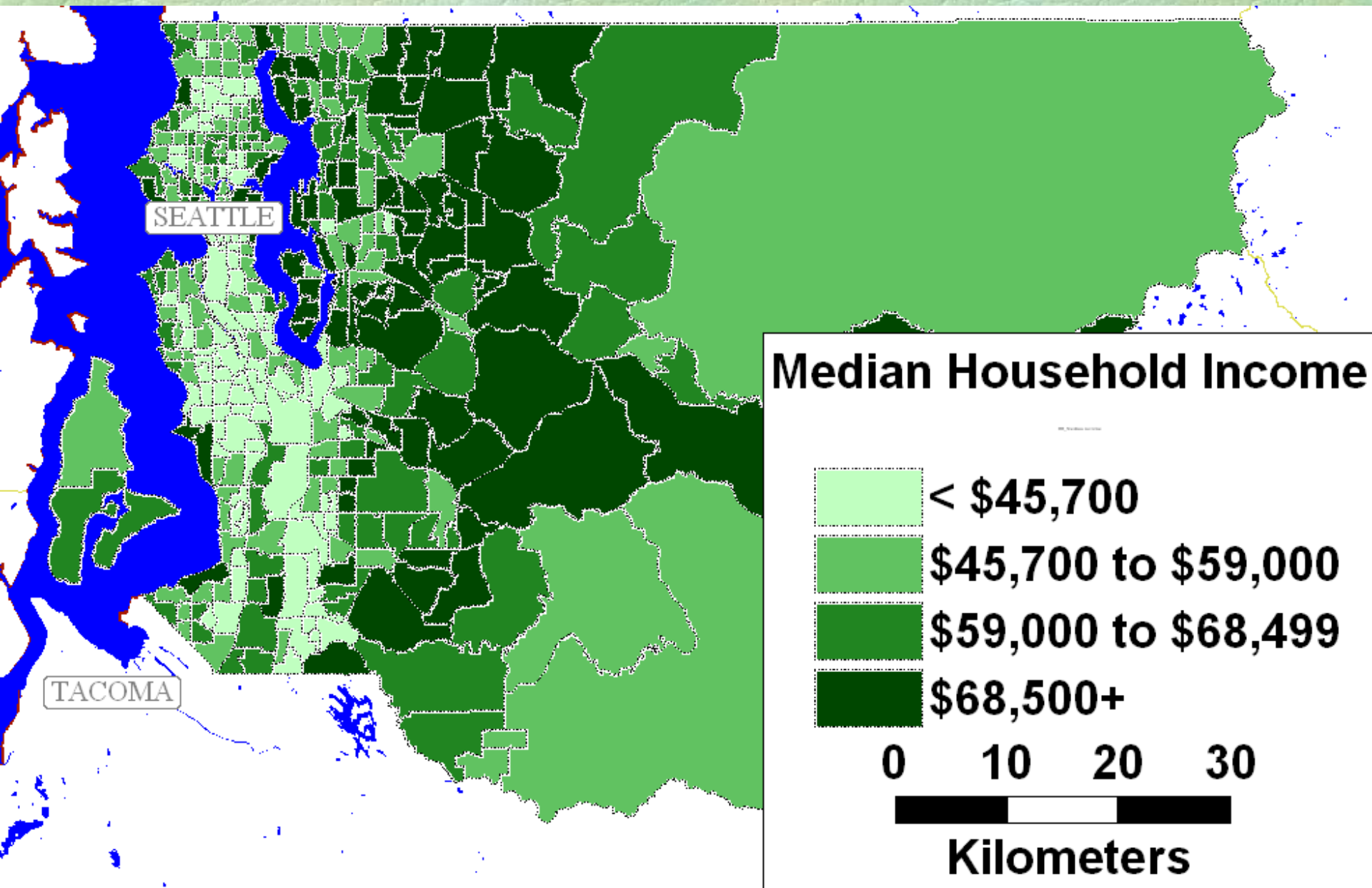
FALSE

Men --- protective, significant for violent crime
Density --- no difference, Seattle, King Co.

Acknowledgements

- Cardiovascular Health Research Unit, University of Washington
- Group Health Cooperative
- Department of Geography, University of Washington
- Royalty Research Fund, University of Washington

Socio-economic Status--King County



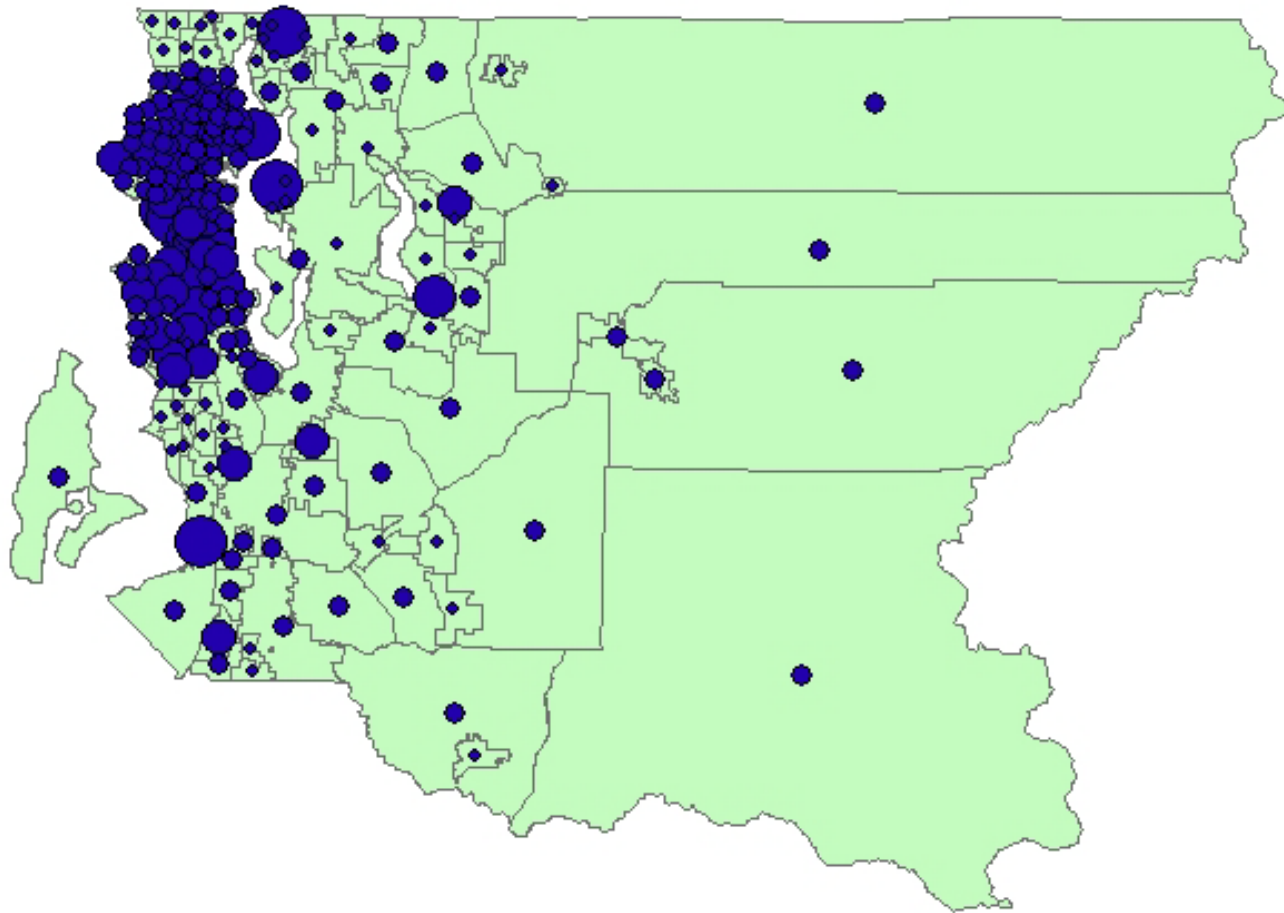
Hypotheses (still remaining)

- 💣 Higher violent/property/total crime rates = lower neighborhood walkability scores.
- 💣 The association between neighborhood walkability scores and higher hours of walking per week will be in stronger in lower crime areas.

Multivariate Analysis

- Run relative risk regression model to predict crime rate, using
- this wasn't a hypothesis...so maybe not run?
- It doesn't make sense to run this because more sidewalks do not produce crime, living in the city produces more sidewalks and more crime.

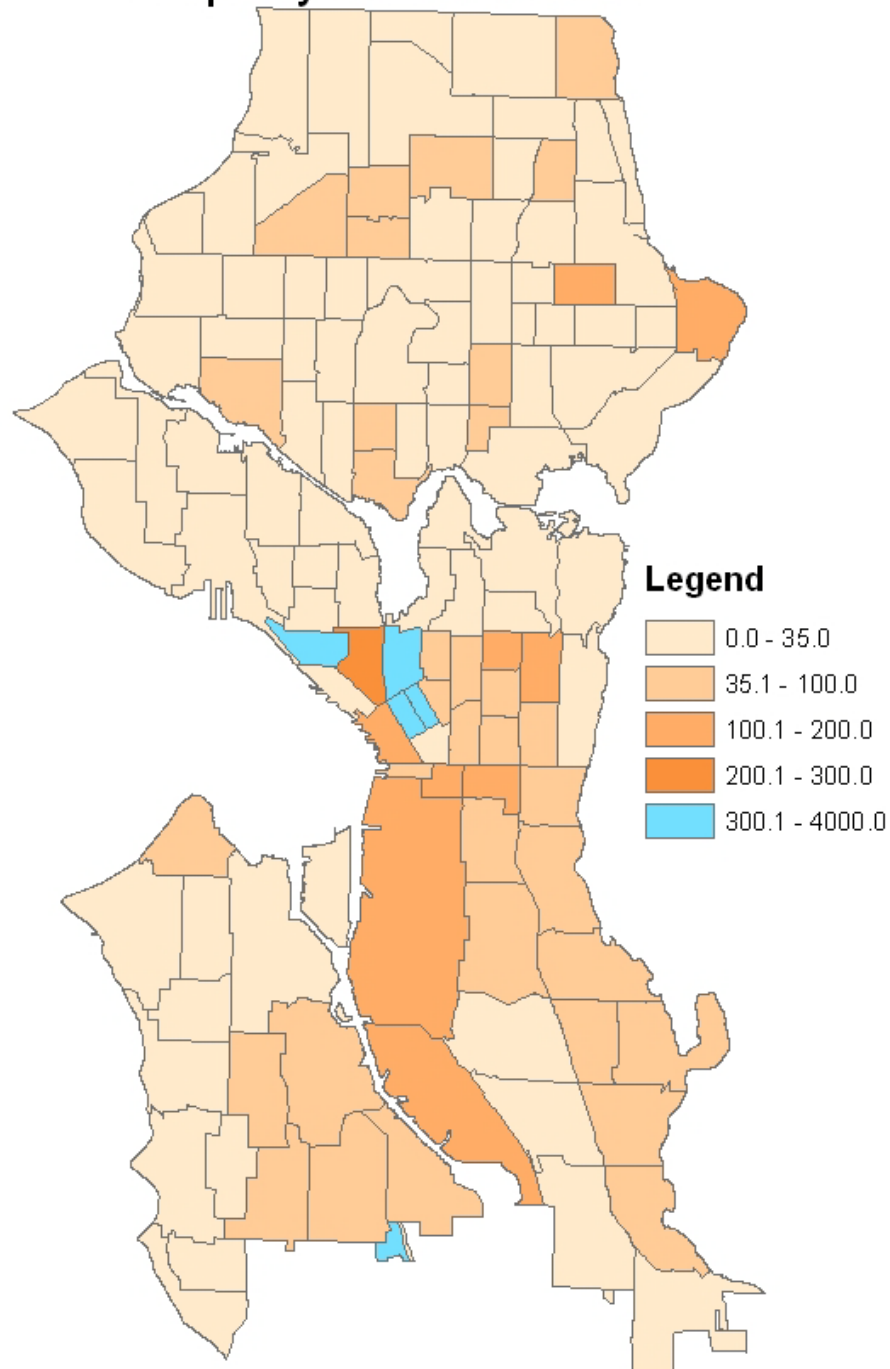
Violent Crime King County



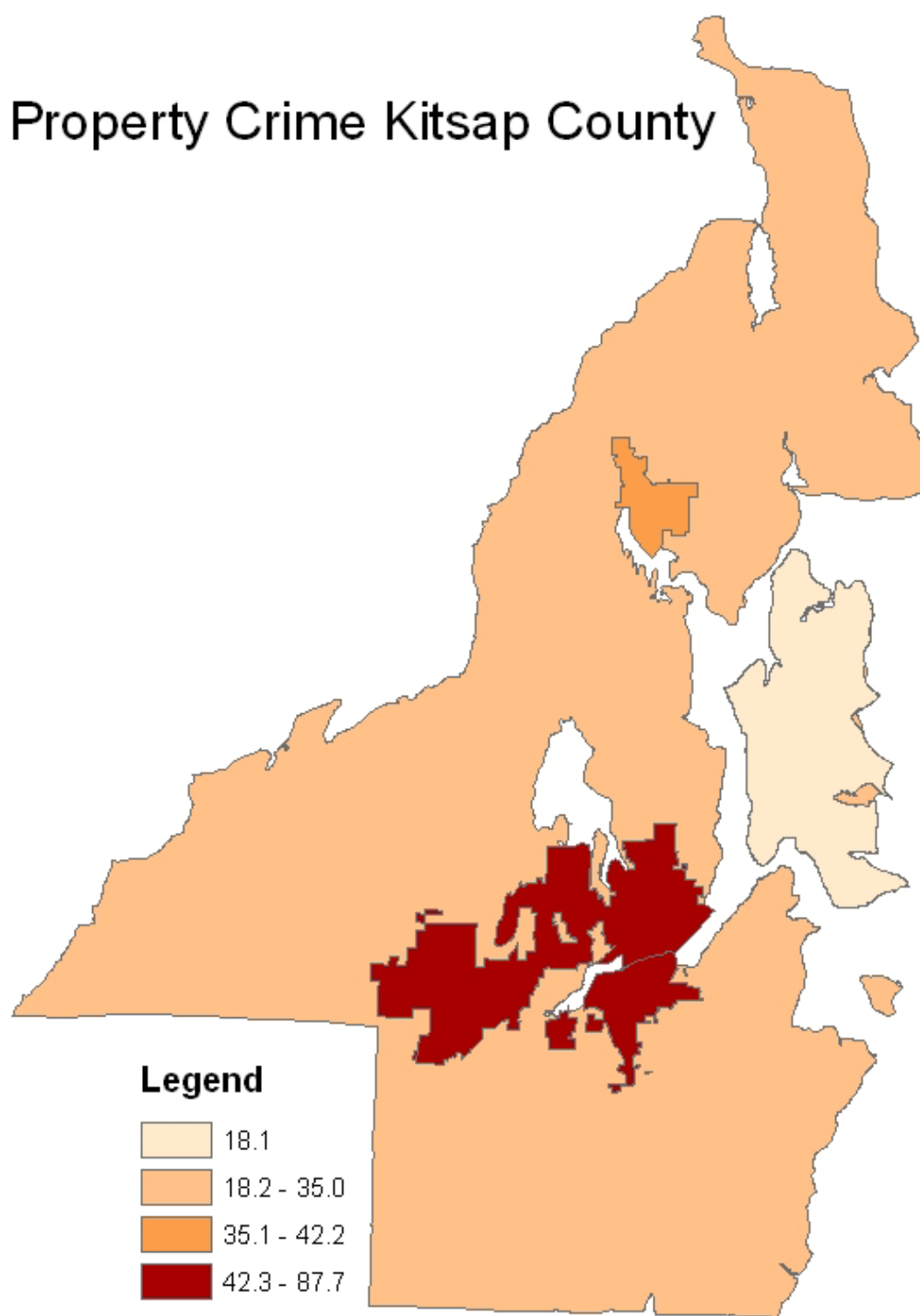
Legend

- 0.0 - 4.0
- 4.1 - 50.0
- 50.1 - 100.0
- 100.1 - 200.0
- 200.1 - 1029.0

Property Crime Seattle



Property Crime Kitsap County



Extra Info

- total crime mean = 62.9
- We also ran the models for rural and urban areas and the results were almost identical to those from the entire sample, adjusted for age and all potential confounders.
- Victims & offenders age, race, gender
- Single family residential
- ORs were transformed to describe a 2-fold increase in crime rates and odds of walking.

Study Subjects

- Age range: 33-79 years
- Age mean: 64 years
- 24% had household income \leq \$25,000
- 86% felt good, very good or excellent health
- 31% retired
- 63% female
- 84% white